Craighead Environmental Research Institute

Monthly Progress Report: June – July 2007

for the Montana Department of Transportation and
Western Transportation Institute

Bozeman Pass Wildlife Monitoring
MSU banner number 425539

1 June 2007 –31 July 2007

This is a combined monthly progress report for both June and July 2007 on the Bozeman Pass Post-Fencing Wildlife Monitoring subcontract: MSU banner number 425539. This is a continuation of Task C of the Bozeman Pass Wildlife Channelization ITS Project which was extended with a subcontract addendum, extension and (the first of two) post-fencing monitoring work scope(s) for CERI to continue their wildlife monitoring field data collection efforts. This addendum covers a limited work scope for one (of two related) contract(s) between WTI and MDT (MSU banner number 425539). It was anticipated that the funds in this account/contract would support CERI in their work through approximately May 2007. A subsequent subcontract associated with the second, related contract (MSU banner number 426899) between MDT and WTI was established for CERI to complete monitoring and evaluation efforts. Ultimately, data produced from both contracts/subcontracts will be merged and analyzed to address the research questions related to wildlife-vehicle collisions and wildlife movements under I-90.

This report was prepared by staff at the Craighead Environmental Research Institute (CERI) for the Montana Department of Transportation and Western Transportation Institute as part of the Bozeman Pass Wildlife Channelization ITS Project.

The objective of Task C (MSU Office of Sponsored Programs subcontract GC200-03-Z3137) is to collect, manage, and analyze field data on wildlife traffic victims and wildlife movements on and near I-90 on Bozeman Pass in order to evaluate the effectiveness of wildlife mitigation techniques applied in this area. The Craighead Environmental Research Institute (CERI) oversees the wildlife monitoring aspects of this project. This task includes oversight of:

- Road-kill data collection and data management;
- MRL overpass monitoring including
  - Behavioral observation sessions of animal-road crossing events
  - Collecting tracking event data from track bed/plate(s)
- Maintaining remote motion/heat-triggered still film cameras at existing culverts
- Supervise field technicians with data collection protocols and quality control;
- Data analysis of road-kill and behavioral crossing data;
- Develop GIS maps and analyses;

· Prepare monthly, quarterly and annual reports and publications.

This project is planned to continue for three year following the MRL bridge re-build which was completed in 2006. Completion of the Westbound lane MRL bridge was scheduled for completion in October 2006 but was not completed until early December. The Wildlife Fencing was planned for completion by November 2006 but it was delayed for a number of reasons and was finally completed in June 2007. The subcontract was modified so that three years of data could be completed beginning in July 2007.

Each task described in the three-year plan is pared down below to reflect the expectations for this work scope. Briefly, CERI was planned to accomplish the following between January and June 2007:

1. Complete sand track bed construction as agreed in the November 2006 addendum (because this serves as an extension to complete tasks agreed to in the November 2006 addendum, the $4,000 budget for those efforts is not included in the January 2007 work scope).
2. Road kill surveys January through April 2007.
3. Camera and counter monitoring at fence ends, jumpouts and culverts, with associated equipment purchases through April 2007.
4. Winter tracking as conditions allow.
5. Track bed monitoring at MRL underpass and on jumpouts from the time beds thaw (~April) through April 2007.

Task 1: Road Kill Surveys during June-July 2007

Road kill surveys were conducted on both sides of I-90 from Bozeman to Jackson Creek and back for a total of 22 miles round trip and an estimated 1 hour of labor per survey.

CERI personnel recorded road-kill on a three-times-weekly basis. Documenting animal-vehicle collisions will continue through June 2010 during the post-construction phase.

Twelve (12) road-kill surveys were driven during June of 2007. One (1) of those recorded no new road-kill. At 22 miles per survey this equals 264 miles driven in June. Thirteen (13) road-kill surveys were driven during July of 2007. Two (2) of those recorded no new road-kill. At 22 miles per survey this equals 286 miles driven in July. Previously data had been collected for a 50 mile stretch (both lanes of Interstate 90 for 25 miles each way between Bozeman and Livingston. This survey effort was reduced to 22 miles for the monitoring subcontract but CERI has continued to survey the entire highway segment and is supplementing the survey budget with funding from other sources. Totals of animals killed by species were:

Bozeman Pass Roadkill Totals	**June**	**July**
Species	**Number**	**Number**
Badger	0	0
Beaver	0	0
Black Bear	0	0
Coyote	0	0
Deer species	1	4
Dog	0	0
Domestic cat	0	0
Elk	1	0
Gopher Snake	0	1
Great Horned Owl	1	0
Ground Squirrel	3	2
Grouse	3	0
Magpie	4	4
Mallard	0	1
Marmot	0	0
Meadowlark	0	0
Mink	1	0
Mule Deer	1	1
Porcupine	0	1
Rabbit	1	4
Raccoon	2	1
Rattlesnake	1	0
Red Fox	0	0
Skunk	6	8

Small mammal spp.	1	2
Weasel	0	0
White Tail Deer	9	2

Task 2: Track bed monitoring at the MRL Bridge in June-July 2007

Sand track beds at MRL bridge are to be monitored for wildlife tracks as an index of movements under the interstate every other week from the time the track beds have thawed and can accept tracks of passing animals (i.e., ~April) through June 2010 for a total of 3 sampling sessions for this work scope/subcontract. Each sampling session will include visiting the track beds 5 days in a row (i.e., rake on day 0, record tracks on day 1, day 2, day 3 and day 4) for a total of 15 track bed site visits through May 2007. Mileage expenses are included for days when no road kill surveys are scheduled (e.g., Tuesdays and Thursdays of sampling weeks).

However, delays in construction of the fencing, and thus the track bed, postponed the start of this task. Construction for the MRL bridge re-build began on April 4, 2006. An access road was constructed across the railroad and track bed on April 15. The westbound lane of the existing bridge was removed on April 18 and the eastbound lane of the bridge was completed in December 2006. Construction necessitated using the track bed location as a staging area for materials and equipment. Consequently monitoring of the track bed was suspended through 2006. Completion of the track bed was finally accomplished on 20 June, 2007.

Because of delays in fence construction, heavy equipment was operating in the track bed area throughout most of June and the track bed could not be completed. By the end of June, most equipment was removed although the railroad crossing was left in place. Consequently there was no track bed monitoring possible in June. During July there was still some heavy equipment using the area occasionally until about 27 July when the temporary vehicle crossing over the MRL rails was finally removed. The track bed was restored at the end of July and track bed surveys began in early August.

Wildlife track data was collected for over one year prior to the time of the bridge re-build. The track bed was monitored on average about every other day; tracks were recorded and the surface was raked clean. Daily visits were done during inclement weather since rain and wind can obscure some tracks if left too long. Deer have been the main users of the underpass. Deer use has been summarized by number of crossings per day whenever possible. This metric will allow comparisons to be made between seasons and to compare rates of crossing before the fencing and bridge re-build with rates after construction.

Task 3: Photo monitoring at fence ends through June-July 2007

Photo monitoring will be used to quantify numbers and species of animals moving around the ends of the wildlife fencing to cross I-90 at grade. A total of 4 remote-trigger IR flash (invisible to passing drivers) digital cameras are to be placed at the 4 termini of the wildlife fencing: three have been placed to date. Monitoring will occur year-round. Camera setup (including equipment purchases and theft-proofing) took about 5 hours. Data downloading will occur in conjunction with MRL track bed visits but cameras do not have to be checked as frequently as the track beds are checked. Because the fencing

installation was delayed until mid-June 2007, task 3 was delayed to accommodate the late fencing installation. CERI installed most of the cameras on June 13. Two were mounted near the fence ends at the East end of the project. One was mounted underneath the I-90 bridge over Bear Canyon Road. Late June and July are scheduled to fine-tune the equipment in order to optimize results. WTI has provided CERI with 4 Reconyx digital IR flash cameras with battery holders at no cost for CERI's use throughout the three-year monitoring effort. Additional budget has been included in this task for CERI to purchase additional necessary accessories as outlined below. WTI and CERI coordinated to "theft-proof" the equipment before it was installed in the field. Theft-proofing was done by James Mehlos with WTI and consisted of a large eye-bolt installed in the camera body. James purchased eye-bolt materials, bicycle-lock cables, and padlocks to secure the cameras to guardrails and bridge piers at the project site using project funds provided. He also purchased "C" batteries for the initial installation. CERI has purchased "AA" rechargeable NiMH batteries and chargers for the duration of the project.

By the end of June no animal crossings were recorded at the fence-ends but movements of construction workers were photographed frequently. Hundreds of photos with no animals or people indicated that the sensitivity was set too high and a lower setting was tried for early July. As of July 18 no animals or people were photographed at the fence ends during July.

Task 4: Infrared counter monitoring at jump outs through June-July 2007

Infrared counters are used to quantify numbers of animals moving over the jump outs. A total of 4 infrared counters were placed at jump outs to monitor wildlife movements; setup (including equipment purchases and theft-proofing) took about 5 hours and data downloading is expected to require 1.5 hours per visit. Jumpout installation was delayed until mid-June 2007; therefore task 4 was delayed to accommodate the late fencing installation. CERI installed the remote counters on June 13 at the four jump out locations. Late June and July are scheduled to fine-tune the equipment in order to optimize results. WTI provided CERI with infrared counters at no cost for CERI's use throughout the three-year monitoring effort. Additional budget has been included in this task for CERI to purchase additional necessary accessories as outlined below. WTI and CERI coordinated to "theft-proof" the equipment before it is installed in the field. Theft-proofing was done by James Mehlos with WTI and consisted of a metal plate installed in the back of the counter. James purchased materials, bicycle-lock cables, and padlocks to secure the counters to fence poles and trees at the project site using project funds provided. He also purchased "C" batteries for the initial installation. CERI will purchased "C" rechargeable NiMH batteries and chargers for the duration of the project.

Fine-tuning the jump-out counters has proven to be more problematical than the cameras. Even at lowest sensitivities the Trailmaster sensors are triggered by false events. Adjustment of counter sensitivity settings continued throughout June and into July: in most cases the sensor needs to be masked with tape to narrow the window through which events are sensed.

Task 5: Track bed monitoring at fence ends, jump-outs through June-July 2007

Track beds are used to verify data collected on remote cameras and counters in case those systems fail or prove unreliable. Species identification from track beds will complement counter data at jump-outs. A total of 8 sand track beds (4 on top of and 4 at the bottom or exit of the 4 jump outs), were planned to be monitored on the same schedule as the track bed at the MRL bridge (see task 2); i.e., from the time the track beds have thawed and can accept tracks of passing animals (i.e., ~April) through April 2010. However, in practice it was decided that track beds were only needed at the top of each jump out. Each sampling session will include visiting the track beds 5 days in a row (i.e., rake on day 0, record tracks on day 1, day 2, day 3 and day 4. Mileage expenses are covered in task 2. However, delays in construction of the fencing, and thus the jump-outs and fence-end track beds, have postponed the start of this task. Completion of the fencing was accomplished in mid-June 2007 at which time jump-out and fence-end monitoring began. No animal tracks were recorded at jump-outs in June and July, and preparation of the track beds continued into July.

Task 6: Photo monitoring of culverts June-July 2007

To reconcile the total movements around at the eastern end of the wildlife fence, cameras can determine if animals have been directed through culverts rather than around fence ends (this is not proposed at the west end of the fence, because there are no below-grade passage opportunities in that area). Two infrared remote-trigger cameras are used in the double culverts at the eastern fence ends; these below-grade culvert movement data will be combined with data from at-grade fence end-runs to assess total movement in that area. CERI installed one of the cameras on June 13. Setup (including equipment purchases and theft-proofing) took about 3 hours and data downloading is expected to require 5 visits, with each visit taking approximately 1.5 hours to maintain the camera equipment and download data. Since delays in construction of the fencing have postponed the start of this task photo monitoring of culverts began in mid-June. Only one camera was installed at that time since extremely high water in the second culvert made installation difficult and dangerous. The second camera was installed on July 24.

Theft-proofing of the culvert cameras is accomplished by placing the cameras on the roof of the culvert about 12 feet above the water. A large extension ladder was used. It may be possible to install an eye-bolt or other anchor into the culvert to secure the camera with a cable and lock, but initially the placement of the cameras will make theft difficult. To steal the cameras will require two or more people carrying a large extension ladder to the site which we hope will deter any attempts.

Two fishermen were photographed going north through the east culvert and returning on June 16. No animals were photographed in June. Neither of the culvert cameras were downloaded in July.

Task 8: Data Management & Reporting in June-July 2007

Data is entered, cleaned and archived by CERI. Data is managed in a manner that will allow for CERI and WTI to analyze and report final results as a team (e.g., keys for spreadsheet headers and other relevant notes will be included in data files).

CERI will send brief monthly reports with associated monthly invoices to WTI describing their efforts for that month including a summary of the data collected, equipment purchases or malfunctions (including any thefts of equipment) and any anticipated absences or difficulties with accomplishing tasks. Data entry and summary required two hours during June and two hours during July.

Discussion

This project has experienced unavoidable delays due to the inability of the wildlife fencing contractor to complete the fencing on time. Fencing was scheduled to be completed in November 2006. The fencing segment west of the MRL bridge was completed about 15 May 2007. The fencing segment east of the MRL bridge was completed on 20 June 2007. Because of these delays, and the fact that fence materials were stored in the area of the track bed, and because equipment traffic continued to traverse the track bed site, we were unable to complete construction of the track bed or the jump-out track beds in June. We were able to install most of the remote sensor cameras and counters at the jump-outs or fence ends.

These delays have also postponed data collection for about 6 months. Since the project was originally designed for a full 3 years of data collection this necessitated extending the contract period for about 6 months until the fall of 2010 in order to collect a statistically significant sample of monitoring data. It is hoped that data collection can be completed by September 2010 and that the final report can be done by the end of December 2010.